CLAIMS

What is claimed is:

1. A leadframe comprising:

a plurality of leads, each lead comprising a first surface, an opposite second surface, and an inner end segment beginning at an inner end of the lead,

wherein a first subset of the leads each include a recess in the first surface of the lead at the inner end segment, a second subset of the leads each include a recess in the second surface of the lead at the inner end segment, and the individual leads of the first subset are situated in an alternating lateral pattern with the individual leads of the second subset such that the recesses in the inner end segments of each pair of adjacent leads are oriented in opposite directions.

2. The leadframe of claim 1, wherein the recess in the inner end segment of the leads extends to the inner end of the respective lead.

3. The leadframe of claim 1, wherein the recess of the inner end segment of the leads of the first subset does not extend to the inner end of the lead, and the leads of the first subset extend further toward a center of the leadframe than the leads of the second subset.

4. The leadframe of claim 1, wherein the leads include a first portion between the inner end segment and a dam bar of the leadframe, and a width of the inner end segments at the respective recess is greater than a width of the first portion of the leads.

5. The leadframe of claim 1, wherein a width of the inner end segments at the respective recess therein is greater than a width of the lead outward of the inner end segment.

6. The leadframe of claim 1, wherein each recess has a vertical depth that is more than half of a vertical height of the lead.

7. The leadframe of claim 1, further comprising a plurality of electrical conductors, wherein the inner end segments are respectively electrically connected to a semiconductor chip by one of said conductors.

8. The leadframe of claim 1, where at least some of the conductors are respectively electrically connected within the recess of the respective inner end segment.

9. A leadframe comprising:

a plurality of pairs of adjacent metal leads, wherein each lead includes an inner end segment beginning at an inner end of the lead, said inner end segments each including a recessed surface, and

wherein the recessed surfaces of each pair of adjacent leads are spaced apart a first distance in a vertical direction, and said first distance is greater than a second distance in a horizontal direction between closest portions of the recessed surfaces of the respective pairs of adjacent leads.

10. The leadframe of claim 9, wherein the first distance is greater than half a vertical height of an unrecessed portion of the lead.

11. The leadframe of claim 9, wherein the second distance is approximately zero.

12. The leadframe of claim 9, wherein the second distance is zero.

13. The leadframe of claim 9, wherein the recessed surface in the inner end segments extends to the inner end of the respective lead.

14. The leadframe of claim 9, further comprising a plurality of electrical conductors, wherein the inner end segments of the leads are respectively electrically connected to a semiconductor chip by one of said conductors, and at least some of said conductors are connected to the recessed surface of the respective inner end segment.

15. The leadframe of claim 9, wherein the recessed surface of one of the leads of the pairs does not extend to the inner end of the lead, and those leads extend further toward a center of the leadframe than the other lead of the respective pair.

16. The leadframe of claim 9, further comprising a dam bar, wherein the leads extend from a dam bar.

17. A leadframe comprising:

a plurality of adjacent pairs of leads each including an inner end segment beginning at an inner end of the lead, wherein the inner end segments each include a recessed surface, and the recessed surfaces of the inner end segments of the pairs are oppositely oriented.

18. The leadframe of claim 17, wherein the recessed surface in the inner end segments extends to the inner end of the lead.

19. The leadframe of claim 17, further comprising a plurality of electrical conductors, wherein the inner end segments of the pairs of adjacent leads are respectively electrically connected to a semiconductor chip by one of said conductors, and at least some of said conductors are connected to the recessed surface of the respective inner end segment.

20. The leadframe of claim 17, wherein the recessed surface of one of the leads of the pairs does not extend to the inner end of the lead, and those leads extend further toward a center of the leadframe than the other lead of the respective pair.

21. The leadframe of claim 20, wherein a semiconductor chip is in a flip chip electrical connection with the inner end segments.

22. The leadframe of claim 17, wherein a width of the inner end segment is greater than a width of the lead outward of the inner end segment.

23. A semiconductor package comprising:

a plurality of adjacent pairs of leads each including an inner end segment beginning at an inner end of the lead, wherein the inner end segments each include a recessed surface, and the recessed surfaces of the inner end segments of the pairs are oppositely oriented;

a semiconductor chip in an electrical connection with the inner end segments of the leads; and

a hardened encapsulant material covering the semiconductor chip, the conductors, and the inner end segments of the leads.

24. The semiconductor package of claim 23, wherein the electrical connection comprises a plurality of electrical connectors bonded between the semiconductor chip and the

inner end segments, wherein at least some of said conductors are bonded to the recessed surface of the respective inner end segment.

25. The semiconductor package of claim 23, wherein the recessed surface in the inner end segments extends to the inner end of the lead.

26. The semiconductor package of claim 23, wherein the recessed surface of one of the leads of the pairs does not extend to the inner end of the lead, and those leads extend further toward the semiconductor chip than the other lead of the respective pair.

27. The semiconductor package of claim 23, wherein the semiconductor chip is in a flip chip electrical connection with the inner end segments.

28. The semiconductor package of claim 23, wherein a width of the inner end segment is greater than a width of the lead outward of the inner end segment.

29. A semiconductor package comprising:

a plurality of pairs of adjacent metal leads, wherein each lead includes an inner end segment beginning at an inner end of the lead, said inner end segments each including a recessed surface, wherein the recessed surfaces of each pair of adjacent leads are spaced apart a first distance in a vertical direction, and said first distance is greater than a second distance in a horizontal direction between closest portions of the recessed surfaces of the respective pairs of adjacent leads;

a semiconductor chip in an electrical connection with the inner end segments of the leads; and

a hardened encapsulant material covering the semiconductor chip, the conductors, and the inner end segments of the leads.

30. The semiconductor package of claim 29, wherein the first distance is greater than half a vertical height of an unrecessed portion of the lead.

31. The semiconductor package of claim 29, wherein the second distance is approximately zero.

32. The semiconductor package of claim 29, wherein the recessed surface in the inner end segments extends to the inner end of the respective lead.

33. The semiconductor package of claim 29, wherein the electrical connection comprises a plurality of metal wires bonded between the semiconductor chip and the inner end segments, wherein at least some of said wires are bonded to the recessed surface of the respective inner end segment.

34. The semiconductor package of claim 29, wherein the recessed surface of one of the leads of the pairs does not extend to the inner end of the lead, and those leads extend further toward the semiconductor chip than the other lead of the respective pair.